

SUPERFUND RESPONSE ACTION PRIORITY PANEL REVIEW FORM**Date Form Completed:** February 26, 2013**General Site Information**

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|---------------------|--------------|---------------------|-----------------|--------|----------|
| Region: | Region 8 | City: | Gunnison County | State: | Colorado |
| CERCLIS EPA ID: | CO0002378230 | CERCLIS Site Name: | Standard Mine | | |
| NPL Status: (P/F/D) | Final (F) | Year Listed to NPL: | 2005 | | |

Brief Site Description: *(Site Type, Current and Future Land Use, General Site Contaminant and Media Info, Site Area and Location information.)*

Site Type: The Standard Mine Site consists of waste materials from mining and milling operations and draining mine adits. Mining for gold and silver began in this region in 1874 and continued intermittently until 1960. The Site includes several levels: Level 1, consisting of mine waste and a draining adit; Level 2, a seeping adit; Level 3, an open adit and a revegetated mine waste pile; Level 5, a small mine waste pile and a draining adit; and Level 98, with a small mine waste pile and a draining adit.

Land Use: The site is located within the Gunnison National Forest and site ownership is both public (US Forest Service) and private. Private property boundaries largely follow historic mining claims.

Site Contaminants and Media: Contaminants of concern are heavy metals. The greatest risk factors are associated with the presence of cadmium, lead, and zinc in surface water. Discharge of acid mine drainage is the principal transport mechanism of contaminants into surface water and the surrounding areas. The site is located at the headwaters of Elk Creek, which flows to Coal Creek, the sole drinking water supply for the Town of Crested Butte. Surface water aquatic life standards are exceeded for cadmium, lead, and zinc in Elk Creek.

Site Area and Location: The site is located near the town of Crested Butte in Gunnison County, Colorado at 10,900 to 11,600 feet above mean sea level. Approximately 10 acres of land were left disturbed by mining activities at the site.

General Project Information

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| Type of Action: | Remedial | Site Charging SSID: | 08JM |
| Operable Unit: | 01 (only 1 OU) | CERCLIS Action RAT Code: | RA001 |
| Is this the final action for the site that will result in a site construction completion? | | | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Will implementation of this action result in the Environmental Indicator for Human Exposure being brought under control? | | | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |

Response Action Summary

Describe briefly site activities conducted in the past or currently underway:

The RI/FS was conducted between 2005 and 2009. During this time two EPA Removal Actions were also conducted. A time-critical removal action was conducted in 2006 to reduce risks from a tailings impoundment. A non-time critical removal action was conducted in 2007 and 2008 to remove the tailings impoundment and waste rock piles, place the materials in a site waste repository, and stabilize the remaining soils and Elk Creek.

The ROD was signed 9/30/11. The selected remedy was split into two phases, source controls (Phase 1) and water treatment (Phase 2), with interim monitoring to determine if Phase 2 is needed. A removal assessment was conducted in 2012 in an attempt to remove a blockage within mine Level 1 and to permit access for design work. This action was only partially successful and was halted due to the onset of winter conditions at the site and the need for additional funding to complete the work.

Due to the unsafe conditions of the underground workings, a complete design of the Phase 1 remedy is not possible at this time. In order to facilitate a thorough and reliable design of the Phase 1 components of the remedy, the Level 1 and Level 3 mine workings must be stabilized and rehabilitated, so that proper health and safety precautions are in place. Therefore, Phase 1 of the remedy will be divided into two segments. Segment 1 will consist of rehabilitating and stabilizing the Level 1 and Level 3 workings. Segment 2 will consist of installing the engineering components of the remedy (bulkhead and sealing Level 3 raises).

Specifically identify the discrete activities and site areas to be considered by this panel evaluation:

This application is for Segment 1 of the Phase 1 remedy. Segment 1 work will include rehabilitating Level 1 and Level 3 mine workings to the extent necessary to provide access and allow full design for source controls. This will entail establishing stable tunnel portals at both Level 1 and Level 3. It will also entail clearing any mine debris, cave-ins, or blockages within the Level 1 workings and Level 3 workings so that the location of a bulkhead in Level 1 and the raises in Level 3 can be safely accessed. The costs for the construction of the bulkhead and the sealing of the raises are not included in this application.

Briefly describe additional work remaining at the site for construction completion after completion of discrete activities being ranked:

Subsequent work will include the following: Segment 2 of Phase 1, design and installation of a bulkhead in the Level 1 adit and source controls in the Level 3 adit; Mine waste at Levels 5 and 98 will be stabilized and adit discharges will be diverted around the waste rock; Interim monitoring of adit discharges and Elk Creek water quality will be performed to determine if Phase 2 is needed; and finally, Phase 2, design and installation of a bioreactor to treat adit discharges at Level 1, would be performed only if needed to meet water quality standards in Elk Creek.

Response Action Cost

Total Cost of Proposed Response Action:

(\$ amount should represent total funding need for new RA funding from national allowance above and beyond those funds anticipated to be utilized through special accounts or State Superfund Contracts.)

Exemption 5: DP

[Redacted]

[Redacted]

[Redacted]

Exemption 5: DP

Source of Proposed Response Action Cost Amount:

(ROD, 30%, 60%, 90% RD, Contract Bid, USACE estimate, etc...)

The costs for Phase 1 are based on the ROD costs adjusted for information gathered during initial Level 1 mine entries and partial rehabilitation during 2012. A cost range is provided due to unknown conditions in the mine behind current blockages and the need to determine final minimum design life criteria based on conditions observed in the workings. Colorado Division of Reclamation, Mining, and Safety provided the high-end cost estimate for rehabilitating the mine workings based on 2012 in-mine work. Additional future funding needed to complete Phase 1 Segment 2 and Phase 2 are estimated from the ROD. Funds for Phase 1 Segment 2 are not being applied for at this time, so the final design and costing can be refined after the mine is fully accessible following the rehabilitation.

Breakout of Total Action Cost Planned Annual Need by Fiscal Year:

(If the estimated cost of the response action exceeds \$10 million, please provide multiple funding scenarios for fiscal year needs; general planned annual need scenario, maximum funding scenario, and minimum funding scenario.)

Exemption 5: DP

Other information or assumptions associated with cost estimates?

The State will provide a 10% cost share (Exemption 5: DP) for the Phase 1 Segment 1 component of the remedy.

Readiness Criteria

1. Date State Superfund Contract or State Cooperative Agreement will be signed (Month)?

August 2013

2. If Non-Time Critical, is State cost sharing (provide details)?

Not applicable for Remedial Action

3. If Remedial Action, when will Remedial Design be 95% complete?

Segment 1 RD will be complete by August 2013

4. When will Region be able to obligate money to the site?

August 2013

5. Estimate when on-site construction activities will begin:

September 2013

6. Has CERCLIS been updated to consistently reflect project cost/readiness information?

Yes

Site/Project Name:

Standard Mine

Criteria #1 - RISKS TO HUMAN POPULATION EXPOSED (Weight Factor = 5)

Describe the exposure scenario(s) driving the risk and remedy. Include risk and exposure information on current/future use, on-site/off-site, media, exposure route, and receptors:

Over 1500 downstream residents are supplied with drinking water from Coal Creek, which is impacted by the site. Although the drinking water intake is not currently impacted, a blowout of water and mine waste from the

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mine could carry contaminated soils, sediments, and water downstream from the site.

Estimate the number of people reasonably anticipated to be exposed in the absence of any future EPA action for each medium for the following time frames:

| <u>MEDIUM</u> | <u><2yrs</u> | <u><10yrs</u> | <u>>10yrs</u> |
|----------------------|------------------------|-------------------------|-------------------------|
| Surface water | 0 | 0 | 1500* |

Discuss the likelihood that the above exposures will occur:

*Downstream recipients of drinking water from Coal Creek may be exposed if the Standard Mine tunnel blows out and releases significantly more water than the current discharge volume or a high sediment load. The Crested Butte Water Treatment Plant performs membrane filtration, ultraviolet disinfection, and chlorination and is not set up to remove significant amounts of metal contaminants. The sub-surface remedy, for which partial funding is currently being requested will address the potential for a blowout of water and mine waste from the mine.

Other Risk/Exposure Information?

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Criteria #2 – SITE/CONTAMINANT STABILITY (Weight Factor = 5)

Describe the means/likelihood that contamination could impact other areas/media given current containment:

Contaminants are transported in the following ways:

The Level 1 adit currently discharges acidic mine drainage and contributes to metals contamination of surface water. A portion of a blockage (rock fall cave-in) was removed from the Level 1 adit during 2012; however, the work was not completed and the likelihood that the remaining blockage could breach and release contaminated water into Elk Creek is unknown. Rehabilitating the Level 1 adit and removing the remaining portions of this blockage is proposed for the 2013 effort.

Adit discharges that flow over waste rock piles mobilize metals and transport them into the adjacent alpine wetlands.

Are the contaminants contained in engineered structure(s) that currently prevents migration of contaminants? Is this structure sound and likely to maintain its integrity?

There is no engineered structure to prevent migration of contaminants within the mine workings. A small retention pond has been constructed outside the Level 1 portal to capture sediment and surface water during spring runoff, but this is limited in size and insufficient to capture sediment or surface water during large flow

events or if a blowout incident were to occur.

Are the contaminants in a physical form that limits the potential to migrate from the site? Is this physical condition reversible or permanent?

The contaminants are not in a physical form that limits the potential to migrate from the site. Contaminants are present in dissolved and total suspended solids form in water that flows freely from the site. Contaminants are also present in sediment and sludge that are transported from within the underground mine workings and from sediment eroding from unremediated mine waste piles at the surface.

Are there institutional physical controls that currently prevent exposure to contamination? How reliable is it estimated to be?

There are no institutional physical controls that prevent exposure to acid mine drainage, though portal gates have been installed to prevent mine access by recreational users of the site. Mine waste piles at Levels 1 and 3 have been capped and revegetated to reduce human exposure to dust generated during recreational activities that may contain heavy metals. Once the vegetation is fully established, the capping and revegetation of these mine waste piles is anticipated to be a reliable way to prevent exposure to metals-laden dust.

Other information on site/contaminant stability?

It is generally understood in the scientific literature that metals transport in surface waters is controlled by several interacting chemical and physical reactions which determine the solubility and mobility of the metal contaminant. These reactions include but are not limited to absorption/desorption from particles, chemical or photo catalyzed oxidation-reduction reactions, and physical transport mechanisms.

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Criteria #3 – CONTAMINANT CHARACTERISTICS (Weight Factor = 3)

(Concentration, toxicity, and volume or area contaminated above health based levels)

List Principle Contaminants (Please provide average and high concentrations.):

(Provide upper end concentration (e.g. 95% upper confidence level for the mean, as is used in a risk assessment, or maximum value [assuming it is not a true outlier], along with a measure of how values are distributed {e.g. standard deviation} or a central tendency values [e.g., average].)

| <u>Contaminant</u> | <u>*Media</u> | <u>**Concentrations</u> |
|---------------------------|----------------------|---|
| Dissolved Cadmium | AMD | 120 µg/L mean; 150 µg/L max; n=25 |
| Dissolved Lead | AMD | 880 µg/L mean; 1800 µg/L max; n=25 |
| Dissolved Zinc | AMD | 23,000 µg/L mean; 27,000 µg/L max; n=25 |
| Dissolved Cadmium | SW | 6.7 µg/L mean; 43 µg/L max; n=60 |
| Dissolved Lead | SW | 6.2 µg/L mean; 66 µg/L max; n=60 |

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| Dissolved Zinc | SW | 1300 µg/L mean; 8200 µg/L max; n=60 |
| (*Media: SW – Surface Water, AMD – Acid Mine Drainage) (**Concentrations: Provide concentration measure used in the risk assessment and Record of Decision as the basis for the remedy.) | | |
| Describe the characteristics of the contaminant with regards to its inherent toxicity and the significance of the concentrations and amount of the contaminant to site risk. <i>(Please include the clean up level of the contaminants discussed.)</i> | | |
| <p>The Site cleanup values for surface water are the Colorado Water Quality Standards for Upper Gunnison River Basin Stream Segment 11. Stream segment 11 is designated for Water Supply, Agriculture, and Class 1 Cold Water Aquatic Life. The standards are based on hardness. Calculated at an average low-flow hardness in Elk Creek of 65 mg/L, the standards are:</p> <ul style="list-style-type: none"> • Dissolved cadmium: 1.17 µg/L acute, 0.31 µg/L chronic • Dissolved lead: 40 µg/L acute, 1.6 µg/L chronic • Dissolved zinc: 108 µg/L acute; 82 µg/L chronic <p>Cadmium, lead, and zinc are known to be toxic to fish and macroinvertebrates. Metals concentrations within the Elk Creek sediments are toxic to macroinvertebrates. This is supported by macroinvertebrate toxicity testing conducted as part of the ecological risk assessment at the site and further supported by the lack of macroinvertebrates and lack of species diversity within the upper portions of Elk Creek near the Standard Mine site.</p> | | |
| Describe any additional information on contaminant concentrations which could provide a better context for the distribution, amount, and/or extent of site contamination. <i>(e.g. frequency of detection/outlier concentrations, exposure point concentrations, maximum or average concentration values, etc.....)</i> | | |
| <p>Surface water aquatic life standards are currently exceeded for cadmium, lead, and zinc in Elk Creek.</p> <p>Level 5 and Level 98 adit discharges also contribute metals to the Elk Creek headwaters, though adit discharges at these levels go into wetlands and not directly into Elk Creek. Average dissolved cadmium, lead, and zinc concentrations in Elk Creek below Levels 5 and 98, but upstream of Level 1 are 0.86 µg/L, 3.1 µg/L, and 170 µg/L, respectively.</p> <p>Water within Level 2 of the mine contains maximum cadmium, lead, and zinc concentrations of 244 µg/L, 970 µg/L, and 24,800 µg/L.</p> <p>The Coal Creek TMDL indicates Elk Creek and a natural fen are the largest sources of contaminant loads to Coal Creek above the Town of Crested Butte's drinking water intake.</p> | | |
| Other information on contaminant characteristics? | | |
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| Criteria #4 – THREAT TO SIGNIFICANT ENVIRONMENT (Weight Factor = 3) | | |

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(Endangered species or their critical habitats, sensitive environmental areas.)

Describe any observed or predicted adverse impacts on ecological receptors including their ecological significance, the likelihood of impacts occurring, and the estimated size of impacted area:

Elevated metals concentrations in water and sediment discharged from the site impact fish and macroinvertebrates in Elk Creek. At this time, trout are only present at the confluence with Coal Creek, likely immigrants from Coal Creek. Contaminated sediments from site tailings and waste rock are also toxic to aquatic life in Elk Creek, but the source and mobility of contaminated sediments was removed during the removal actions and the existing sediments will gradually wash through the system.

Would natural recovery occur if no action was taken?
If yes, estimate how long this would take.

☐ Yes ☒ No

Natural Recovery will not occur in human time scales.

Other information on threat to significant environment?

The ecological risk assessment calculated Hazard Quotients (HQ) greater than 1 for fish and benthic invertebrates exposed to Elk Creek surface water. The highest HQ was for cadmium (87). Elk Creek is designated as Class 1 cold water aquatic life.

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Criteria #5 – PROGRAMMATIC CONSIDERATIONS (Weight Factor = 4)

(Innovative technologies, state/community acceptance, environmental justice, redevelopment, construction completion, economic redevelopment.)

Describe the degree to which the community accepts the response action.

The community has been very involved in the Standard Mine investigation and cleanup. The Standard Mine Advisory Group, Technical Advisory Group, Coal Creek Watershed Coalition, High Country Citizens Alliance, and the Town of Crested Butte have participated in the project since before the site was listed in 2005, including assisting with water quality assessments.

Comments from the community on the Proposed Plan strongly supported the selected remedy. The community praised EPA for our involvement of the community at all stages of the RI/FS and remedy selection process. The community was pleased that EPA chose a multi-phased approach which allows for re-evaluation of water quality between phases of the remedy. They support the idea of source control within the mine workings and strongly support the use of a passive treatment system as the selected water treatment remedy for Phase 2 of the selected remedy.

Describe the degree to which the State accepts the response action.

The State accepts and supports the need for an incremental/segmented approach to the Phase 1 remedy to allow for proper design and costing of the tunnel rehabilitation, bulkhead, and sealing of the Level 3 raises in an iterative fashion. This will provide the State with the comfort of knowing what their share of the costs will be and will allow for flexibility in the design of the various components.

Describe other programmatic considerations, e.g.; natural resource damage claim pending, Brownfields site, use of innovative technology, construction completion, economic redevelopment, environmental justice, etc...

The Phase 1 underground source control portions of the final remedy are well-known engineering controls used by the mining industry, however the controls used in Level 3 have not been widely used at Superfund sites. Rehabilitation of the Level 1 and Level 3 mine workings is estimated to span two years due to the short three month construction season at the site.